

# Notice of Allowability

Application No.

10/824,387

Examiner

Etsub D. Berhanu

Applicant(s)

BAE ET AL.

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## -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed 12 September 2006.
2. ☒ The allowed claim(s) is/are 1-49.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All b) ☐ Some\* c) ☐ None of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

### Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date 10/24/06
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Eugene Lee on 08 December 2006, wherein amendments to better disclose the Applicant's intended claimed invention were discussed.

The application has been amended as follows:

Claim 1 has been amended to read:

1. An apparatus for measuring a bio signal, comprising:

a bio signal measurement unit, which is insertable into an ear to be in close contact with an internal surface of the ear, the bio signal measurement unit having a photo-plethysmography (PPG) measurement module for radiating light of different wavelengths onto the internal surface of the ear, detecting light transmitted through the ear, and outputting a PPG signal including bio information;

a control unit having a PPG signal processor for generating the bio information using the PPG signal measured by the PPG measurement module and a sound processor for simultaneously outputting a sound signal without any bio information signal interference, wherein the control unit outputs the bio information when a signal received by the control unit corresponds to the bio information, and outputs the sound signal when [the] a signal received by the control unit corresponds to the sound signal;

an output unit for displaying the bio information generated from the control unit; and

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an earphone connected to the control unit for outputting the sound signal received from the control unit, wherein the control unit further includes a sound processor for controlling the volume of the sound signal.

Claim 22 has been amended to read:

22. An apparatus for measuring a bio signal, comprising:

a bio signal measurement unit, which is insertable into an ear to be in close contact with an internal surface of the ear, the bio signal measurement unit having a photo plethysmography (PPG) measurement module for radiating light of different wavelengths onto the internal surface of the ear, detecting light transmitted through the ear, and outputting a PPG signal including bio information, and further having a first plurality of electrodes for outputting the PPG signal;

an earphone having a speaker for outputting sound a second plurality of electrodes on an outer surface to be connected to the first plurality of electrodes of the bio signal measurement unit to receive the PPG signal output from the bio signal measurement unit;

a control unit having a PPG signal processor for receiving the PPG signal through the electrodes of the earphone and generating bio information using the PPG signal and a sound processor for simultaneously outputting a sound signal without any bio information signal interference to the earphone; and

an output unit for displaying the bio information generated from the control unit.

Claim 42 has been amended as follows:

42. A method of measuring a bio signal using an ear type bio signal measurement apparatus including a bio signal measurement unit, which is insertable into an ear to measure a bio signal, an earphone having a speaker for outputting a sound signal, a control unit for generating bio information

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using the measured bio signal and for simultaneously providing the sound signal to the earphone without any bio information signal interference, and an output unit for outputting the bio information, the method comprising:

(a) receiving infrared rays radiated from an eardrum and measuring a body temperature using the bio signal measurement unit to be provided as a bio signal;

(b) radiating light having different wavelengths onto an internal surface of an ear, which is in close contact with the bio signal measurement unit, to measure a photo plethysmography (PPG) signal including bio information and measuring at least one bio signal from among the group consisting of oxygen saturation, a pulse rate, and a respiration frequency, using the PPG signal; and

(c) outputting the at least one bio signal measured in (a) and (b) to the output unit when a signal received by the control unit corresponds to the bio signal and outputting the sound signal to the earphone when [the] a signal received by the control unit corresponds to the sound signal, wherein (a) and (b) are simultaneously performed.

2. The following is an examiner's statement of reasons for allowance: None of the prior art teaches or suggests, either alone or in combination, an apparatus or method comprising a control unit with a PPG signal processor for generating bio information and a sound processor for simultaneously outputting a sound signal, wherein the sound signal does not experience interference from the bio information signal, in combination with the other claimed elements or steps.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Etsub D. Berhanu whose telephone number is 571.272.6563. The examiner can normally be reached on Monday - Friday (Every other Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eleni Mantis-Mercader can be reached on (571)272-4740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

EDB

ERIC F. MINAKOS  
PRIMARY EXAMINER  
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